

## **REMARKS**

### **1. Formal Matters**

The Applicants respectfully acknowledge the Notice of the Official Draftsperson's Review of the drawings filed with the application. The Applicants respectfully request postponement of the requirement to submit formal drawings responsive to drawing informalities cited in the Notice until the application is in condition for allowance. Although the Notice cited photographs, the Applicants respectfully note that none of the drawings originally filed with the application are in the form of photographs, and believe that no petition to enter photographs into the application as drawings is required.

### **2. Claim Rejections – 35 U.S.C. § 102(b)**

In the Office Action dated November 6, 2003, claims 1-12 stand rejected as anticipated by Taner, M., *Kohonen's Self-Organizing Networks With "Conscience"*, Seismic Research Corporation, 1997 (Taner). The rejection is respectfully traversed for the following reasons.

Claim 1 recites a method of geophysical exploration including: organizing seismic data using an unsupervised learning network; correlating a portion of the organized seismic data with lithological data from a wellbore located in a subsurface region of interest, and applying the correlation to the seismic data to estimate lithology in the subsurface region of interest.

The cited portion of Taner discloses generating a self organizing map (SOM) from seismic data using Kohonen's algorithm (p. 4, "Uses of Self Organizing Maps", lines 2-12). Seismic data that are organized into an SOM will have classification boundaries or clusters based on the particular seismic attributes that are organized into the SOM. No lithological meaning is attached to the clustered or classified seismic attributes in the SOM (Taner, p. 4, "Uses", lines 11-12) at that point in the disclosed process or use. The process disclosed in Taner then makes use of a lithologic column, which as explained in Taner may be from well information or from experience in the particular geographic area represented by the SOM, to choose particular ones of the seismic attributes that give SOM classification boundaries (rather than lithologic classifications themselves) that appear similar to the classification boundaries present in the lithologic column.

Taner, however, does not disclose, as recited in claim 1, correlating lithologic information from a well to the SOM-classified seismic data and then using the correlation to estimate lithology from the seismic data within the subsurface area of interest. Notably, in some embodiments of the invention of claim 1 result in lithologic classifications being correlated to Kohonen-classified seismic attributes, such that appearance of particular seismic attributes in seismic data enables selecting a lithologic classification from the seismic data. Taner does not disclose or suggest the foregoing use of correlation and classification to determine lithology from seismic data, but only discloses that the lithologic column is used to provide classification boundaries. Accordingly, Taner cannot anticipate claim 1. Claims 2 and 3 ultimately depend from claim 1 and are patentable over the art of record for at least the same reasons advanced with respect to claim 1.

Claim 4 recites organizing seismic data into Kohonen classes. The organized seismic data are correlated to lithology data classes from lithological data from a wellbore in the area where the seismic data were acquired. The correlated Kohonen-classified data are then used to determine lithology from the seismic data measured at a measurement location, which can be at some distance from the wellbore. The use of Kohonen-classified data to estimate or determine lithology in a measurement location from a correlation between Kohonen-classified data and lithology data is not disclosed in Taner. Accordingly, claim 4 is not anticipated by Taner. Claims 5 and 6 depend from claim 4 and are patentable over the art of record for at least the same reasons advanced with respect to claim 4.

Claim 7 is similar in nature to claim 4, but includes organizing a plurality of lithology measurement values into Kohonen classes by using a Kohonen neural network on the lithology measurements. Seismic data from the area near a wellbore are then organized into Kohonen classes and are correlated to the Kohonen-class organized lithology data. The correlation thus determined is applied to the seismic data to determine or estimate lithology in a subsurface region of interest. By contrast, Taner does not disclose or suggest organizing lithology measurement data into Kohonen classes, nor does Taner disclose or suggest correlating Kohonen-classified lithology measurements with respect to organized seismic data. Accordingly, Taner cannot anticipate claim 7. Claims 8 and 9 ultimately depend from claim 7

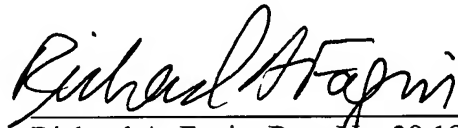
and are patentable over the art of record for at least the same reasons advanced with respect to claim 7.

Claims 10, 11 and 12 recite a device readable by a computer to perform a process including each of the process elements recited, respectively, in claims 1, 4 and 7. For the same reasons advanced with respect to claims 1, 4 and 7, claims 10, 11 and 12 cannot be anticipated by Taner.

The Applicants believe that this Reply is fully responsive to each and every ground of rejection cited in the Office Action dated November 6, 2003, and respectfully request early favorable action on their application.

Respectfully submitted,

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